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Pictorial Side of "Captain Blood"
By Steve Smith, Jr., A. S. C.

"Dedication Number" to Commemorate Opening

Consolidated Buys Standard Film Laboratories

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American Cinematographer

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Consolidated Buys Standard Film Laboratories

Six Million Dollar Corporation Actively Enters Film Business in Los Angeles.

Takes Over Effects *of* One *of* World's Most Modern Laboratory Establishments.

In a deal that is announced as having involved one million dollars, the Standard Film Laboratories of Hollywood last month passed to the control of the Consolidated Film Industries, Inc.

Consolidated is an eastern organization with a capitalization of six million dollars. It was brought into being late last spring through the banding together of several eastern laboratories, namely, Craftsmen Film Laboratories, Erbograph Company, Republic Laboratories and Commercial Traders Cinema Corporation.

Yates in Hollywood

Herbert J. Yates, vice president of Consolidated, is in Hollywood directing affairs at the old Standard as the managing director of the former organization.

The purchase of Standard brings to the Consoldiated fold one of the most modern laboratories in the world, but despite the excellence of the equipment of the plant, it is announced that thousands of dollars will be spent at once in more facilities and paraphernalia.

New Plant

Standard was completed a little more than two years ago, on an extensive site at Seward and Romaine streets, near Santa Monica Boulevard, Hollywood. Its founders and heads until the recent deal were John M. Nickolaus and S. M. Tompkins, two widly known laboratory experts. Nickolaus has since joined Metro-Goldwyn-Mayer studios at Culver City as chief of the laboratory with that production outfit.

Last year, with Nickolaus and Tompkins at the head, the interests of Standard were broadened in the purchase of the Hollywood Studios, located on Santa Monica Boulevard near Seward street. With the changed ownership of Standard, however, the studio is understood to have reverted to the original owners. Standard also lauched into the production field to a measure with the making of an educational-industrial film, "The Port of Opportunity," the locale of which was the harbor to Los Angeles at San Pedro, California.

Under the guidance of Nickolaus and Tompkins, Standard handled the film of various of the West's most prominent producers, numerous of the screen's most successful productions having been taken care of in their laboratory.

Location of Consolidated in Hollywood did not come as a surprise as it was reported in the May issue of the *American Cinematographer,* subsequent to the New York merger, that the expanded organization planned to be established in a large plant in Los Angeles.

Release Prints

Consolidated will concentrate on the subject of making release prints as well as the negatives in Hollywood, instead of leaving the completed prints to the Eastern laboratories, according to a statement by Herbert Yates.

Yates Analyzes Situation

"The most far-reaching effect," Yates said, "of our establishing a branch in Hollywood will be a greatly facilitated service on completed pictures to exchanges and distribution points in the west. Heretofore producers have employed local laboratories only to develop their negatives and make one sample print of their completed picture. The negative is then sent to New York laboratories. Here the facilities for quick service were much greater. The necessary prints for showing in all parts of the United States were made and shipped there. This not only caused delay in the delivery of completed pictures to distribution points, but also made it impossible for the producer to give his personal attention to each print."

To Enter England

The scope of the six million dollar corporation is indicated, as was announced in May in this publication, in the intention to establish a large laboratory in England. The purpose of this arrangement is given as making negatives, placed with Consolidated in the United States, available for printing in foreign countries, thus working for prompt delivery of a product turned out according to American standards.

Personnel

Consolidated's personnel includes L. James San as president and general manager; Herbert J. Yates, who is in charge of affairs at Hollywood, Harry M. Goetz and Leonard Abrahams, vice presidents; Benjamin Goetz, treasurer; and Herbert E. Witmer, secretary.

These officers, together with Ludwig E. B. Erb, Morris San, Edmund C. Dearstyne and Joseph San comprise the board of directors. Special representatives of the new force are Benjamin Goetz and J. Brophy. W. H. Evarts and A. Canter will continue in the sales force.

It is understood that E. G. Patterson, sales manager for Standard, will continue with the new organization. During his Standard connection, Patterson made exhaustive journeys throughout the country among exhibitors, distributors and film executives.

While the gigantic merger marks the retirement from active participation on the part of Ludwig G. B. Erb, he will serve on the board of directors as chief technical advisor.

Jackson J. Rose Made Camera Chief *of* Clarence Brown Production

Jackson J. Rose, A. S. C., has been made chief staff cinematographer for Clarence Brown, Universal-Jewel productions and is at present photographing "Smouldering Fires" with a cast that includes such celebrities as Pauline Fredericks, Wanda Hawley, Laura La Plante, Malcolm MacGregor and Tully Marshall.

The company is scheduled to leave for Yosemite shortly on location.

Rose's affiliation with Brown makes ace join ace as Brown is one of the Universal's topnotchers, he having directed three of the past year's eminent successes—"The Acquital," "The Signal Tower" and "Butterfly." Rose has long been a leader in his calling, having begun his career at old Essanay. He has filmed many important productions including John M. Stahl's "The Dangerous Age."

Pictorial Side of "Captain Blood"

By Steve Smith, Jr., A. S. C.

Camera Made *to* Trumpet Swashbuckling Action *in* Sweeping Tale of High Seas

An angle of the deck fighting action.

A great deal of the pleasure derived from the audience from seeing a film production must, with due credit, be traced directly to the understanding of the photographer in charge. It is not always the case that the man turning the crank gets the praise that is rightly his, but his efforts are important and highly interesting. In the finished super-production that Director David Smith made for the Vitagraph, "Captain Blood," there were a great many very interesting knots for the cameraman to unravel.

Two Main Thoughts

It is the rule for us to approach the taking of a large picture with two main thoughts in mind. That we must get into our work all the artistic value that can be obtained; that we must make to the eye a pleasing thing so that the mind will respond to that stimulus and a happy impression be created. Too, there must be a verity to all shots that makes for realism. And, secondly, that we must be aware that pictures cost money and the thought of finances must not be lost in striving for better pictures.

To the audience as well as to the craft a telling of some of the more interesting shots that filled "Captain Blood" has an interest, and with these we will deal.

Thinking Before Taking

The large courtroom scene where Peter Blood is tried as a rebel before the bilious and sour Lord Chief Jeffreys is a typical indoor shot that needs thinking before taking. It was necessary to give to the audience by photography a mental condition that could not be told by physical action. We were called upon to create an atmosphere of deep legal gloom, age old mental repression that subdues people in a courtroom, tenseness, and a feeling of the futility of finding justice in a law wrangle. And to do this, light became our only medium.

No Value Lost

Lighting is the greatest tool that a cameraman has at his command. The technical staff had finished a tremendous vaulted, ceilinged room, with galleries on each side and the docket for the prisoner and bench for the law. By diffusing the light where it struck the gallery crowds they were subjected to the background, semi distinct, yet definable, while the important action and attendant characters had to be brought strongly enough

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Top. Blood's flagship, "Arabella," beginning her nose dive. This shot was taken at ten in the morning.

Right Explosion of 3600 pounds of 100% dynamite which started the "Victorieuse" to the bottom Filmed off Catalina isthmus at mid-afternoon.

Bottom View of the camera staff on "Captain Blood" on Bird Rock off the Catalina isthmus.

J. Warren Kerrigan (Captain Blood) and Jean Paige (Arabella Bishop) in the garden scne before the Governor's home. This shot was hastily converted from an almost desolate end of the studio.

At the left appears an example of the windows that caused so much trouble inside the "Arabella" At the right is a difficult mirror angle Where was the camera to get such an effect?

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into the light so there was no losing of the value of their facial action. This problem was one of lighting solely and the desired result obtained depended upon that.

Tempering Light

The scenes shot of the selling of slaves in the market can be classified as interiors but held different problems than those of the courtroom. It was necessary to picture the full cast as they stood in front of a large open door way. A hot mid-day sun lighted the crowd of curious natives that had gathered outside and gave to them more light value than the principals had. It was found that with chiffon screens hung across the door and kleigs used inside the light could be tempered to the right degree. The result was nearly that expected.

Much Glass

A third interesting interior shot almost wrecked the good humor of the camera staff and proved to be the hardest of all interiors made on the picture. It was the interior of the cabin of the ship Arabella. The technical staff had built an ornate boat cabin of hewn timber with glassed windows on every side, permitting a flood of light from all angles. Try as we did to eliminate there would always be the reflection of an arc light on one window or another. It was a tough nut to crack. Finally it was accomplished with the use of "niggers" and the deft arrangement of small spot lights. Some of the prettiest shots of the picture resulted from solving this lighting question.

Different Handling

These few interior shots have been described for the purpose of showing that all interiors do not require the same handling of props to get the results, and that they are conquered by different means in each instance. The outdoor scenes are not met in the same manner and some of these required figuring to do.

Waiting On Wind

The location of the fight between Captain Blood and his pirate co-partners, Levasseur, was among the sand dunes near the sea. It was facing west and the setting sun to get the best angle for us. The wind whipped the sand into the faces of the cast and ruined makeup for most of the day, not to say what it did to the camera. After experimenting until late into the afternoon it was found that the only possible shot would have to be made late in the day after the wind had gone down. This brought the sun low enough to be an important element and a dangerous one. A few palms judiciuosly placed and the ever handy "niggers" fixed things and saved the day.

Modern Objects Interfere

To bring out in all its cruel hardship the scene that dealt with the whip-driven slaves plowing in the hot sun was not an easy task. The camera crew decided that a common place location near the studio could be used. That is, it could be used if the right angles to shoot from were available and provided that the direction of the plow could be kept in line away from tell-tale modern object. The

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Manhattan Mutterings- By PHILIP H. WHITMAN, A. S. C.

Hail! Hail! The Gang's All Here

¶ If the steady influx of California cinematographers continues at the present rate, it looks as though we will have to move the new A. S. C., headquarters from Hollywood Blvd., and Ivar St. to Forty-Second and Broadway. True, many of the sun-kissed sons stay but a short time but without exception they all come back for more, despite the heat, cold, working conditions, soda fountains and lack of cafeterias. That's great. Come one, come all and rest assured that New York will both welcome and overpower you at one and the same time.

That Coogan Bunch

And so it was with sunshine in our hearts, if not in our sky, that we welcomed Frank B. Good, A. S. C., who arrived with Edward Francis Cline, his director, to make the exteriors for the current Jackie Coogan production. Good old Frank. A big-hearted boy from the wide open spaces where canary birds sing bass. Frank arived fully resolved not to buy any Woolworth Buildings or Brooklyn Bridges. Within 24 hours they had sold him Central Park, two subway trains and all of the busses on Fifth Ave.

Cutting

¶ Director Bill Nye has just finished his latest picture, "Born Rich" for the Garrick Picture Corp. Bert Lytell and Claire Windsor are the feature players, the photography being handled by George Folsey.

New Production Unit

¶ Director Webster Campbell has started production on "Sandra" starring Barbara La Marr for Sawyer-Lubin Production. Work is being done at the Biograph studios with Rudolph Bergquist at the camera.

Tough Luck

¶ We have all heard the joking impression, " A Bug In His Ear," but Roy Overbaugh, A. S. C., fails to see the joke. While on location with Director John Robertson in Florida, Roy had the misfortune to have a swamp insect of some kind fly into his ear. As a result, an infection set in and Roy has been confined to bed and under a doctor's care for over two weeks. During his absence from the Richard Barthelmess production John Seitz, A. S. C., is substituting as chief cinematographer.

In Gay Paree

¶ Comes the news from abroad that Kenneth Gordon MacLean, A. S. C., has arrived safely in Paris enroute to Rome to join the Ben Hur production forces. Friend Mac, who was accompanied on the trip by a staff of technicians, is to do all the trick and miniature work for Director Fred Niblo. MacLean stopped over in New York for a day or two before sailing and renewed many old friendships. We join with many in wishing him the best of luck.

Pulling a Fast One

¶ If you think New York assistants are not fast, lsten to this one pulled by Matty Cohen who happens to be the writer's assistant. I was shooting some very im-

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Dedication Number to Commemorate Opening

A. S. C. Decides to Issue Special Number to Preserve Memory of Epochal Event.

Number to Be Replete with Material of Lasting Value on Motion Picture Matters.

To commemorate the opening of the new offices of the American Society of Cinematographers in the Guaranty Building, the forthcoming October issue of the *American Cinematographer* will be published as a "Dedication Number."

This issue will trace the progress of the cinematographer from the earliest days—from the pioneer days in New York and Los Angeles through the various periods until the American Society of Cinematographers was founded in the latter part of 1918 with the consequent steady advancement in the cinematographic art.

This "Dedication Number" will be without precedent, nothing of its kind having ever been essayed heretofore—it will crystalize within the columns of the printed page just what progress cinematography (and that really means the industry) has made since films first found their way into the nickleodeons.

The decision to issue the special number was made by the American Society of Cinematographers after a full consideration of the possibilities with which it is fraught. In a word, it will attempt to preserve for posterity a marking stone of the 1924 stage of cinematography as compared with its initial status.

It is planned to make the "Dedication Number" of something more than transient interest which attends similar enterprises. It is hoped that this issue of the *American Cinematographer,* more than any others, will be of such value that it may carry within itself the urge for preservation for future reference.

While the issue is being made primarily to place the opening of the A. S. C. offices permanently on the calendar of things cinematographic, it is hoped that the contents of the number itself will be of such as to make it memorable as a piece of film literature.

Plans for the "Dedication Number" were brought to a conclusion at a recent open meeting of the American Society of Cinematographers and as a result every A. S. C. member is working to make it a thing of lasting success.

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portant scenes the other day when I discovered that the magazine I was using on my camera was leaking light. Calling Matty I told him to go get me a magazine and not to come back without a good one. In about two minutes he dashed back and handing me a copy of the *American Cinematographer* said, "You can't beat that one boss."

Answer

¶ We want to know:

What Ales Joe Morgan?

If Gilbert Warrenton once lived at 52nd and Broadway?

Why Bob Kurrle didn't say hello to anyone while in New York?

How the people on Riverside Drive feel since missing George Barnes in his Chandler Sedan?

Which one was Fred Jackman in the picture published in last month's "Cinematographer?

What on earth Charlie Rosher is doing in Berlin?

and

Why they call me MY BOY PHIL?

The Editors' Lens - - - - *focused by* FOSTER GOSS

¶ With Consolidated's acquisition of the Standard Film Laboratories, is carried the announcement that the new Hollywood organization is to concentrate on the making of release prints *in Hollywood*—at the seat of film production.

¶ Such a policy has been urged repeatedly and its consummation will fulfill the desires of many. Proponents of such an arrangement have many reasons therefor—prevention of duplication in methods and overhead; eliminating turning over the making of release prints to a lab crew which is not in direct and personal touch with the cinematographer; saving of time, etc., etc.

¶ This much is certain—too much care cannot be taken with the release prints—*as from them the public sees the picture.* Bad work in their making costs money to everyone from the exhibitor to producer and a loss of prestige to the cinematographer.

¶ As John M. Nickolaus, one of the retiring heads of Standard, is wont to say, the release print sums up all that the producer has expended—in "a lot of little pictures."

¶ Making motion pictures still is regarded as somewhat of a romance, not only in the various states of the union, but more so in foreign lands. It indeed is an important event to the populace when a film company arrives in a community on the other side of the world.

¶ From that company, such a community—as well as the entire country thereabouts as its influence may be felt—forms or reforms, from first hand information or observation, its opinion of the industry in general. There is nothing like personal contact; and it is an unusual kind of familiarity that will not breed contempt.

¶ It is to the interest of filmdom as a whole, then, that only such companies that do not tend to misrepresent pictures be tolerated to go to the out-of-way places where they will be looked upon as representing the cinema.

¶ In brief, organizations which are formed in such a manner as to result in distrust instead of confidence abroad are to be discouraged. Taking pictures in remote places should be something more than a pleasure trip around the world for the participants; and this should be especially borne in mind out of justice to the outfits that are really *working* to get travel pictures. What hardships will be worked on the latter companies if they have to go into a region which has had an unpleasant experience with a preceding film outfit.

¶ *And when native picture sources and necessary local courtesies come to be denied the people whose product will eventually reach the screen, the public, in the ultimate, is robbed of entertaining education.*

One Half of One Percent?

¶ In a series of articles which appeared in the Wall Street Journal, a leading Eastern financial daily, and reprints of which have been circulated by the Association of Motion Picture Producers, there appears, among other statistics on film production, the item that the salaries paid cinematographers, together with directors and "assistants" amounts to ten per cent of the of the negative cost.

¶ If ten percent of the negative cost includes, besides the cinematographers' salaries, those paid to the director and "assistant," then what must be the percentage of the entire negative cost paid the cinematographer—when the ratio of his pay to that of the director is considered, not to forget the wages of assistants which also must come out of the ten percent.

¶ In considering the fact that motion pictures *are* pictorial—strange as it may seem—the cinematographers' percentage is infinitesmal.

¶ Says L. B. Fowler, motion picture editor of the Illustrated Daily News: "To date, it is sanely and frankly admited, motion pictures have achieved largely nothing authentically artistic, unless it is in the advancement of photography . . . What constitutes the artistic beauty of a painted landscape is mood and the peculiar human quality that the artist throws into his work. A cinematographer with some understanding of aesthetics can duplicate, and very often emphasize, a natural scene on the screen, without detracting from the dramatic quality of his picture."

Ernest Haller, A. S. C., is filming " Go Getters" at the F. B. O. studios, Del Andrews directing. Alberta Vaughn and George O'Hara head the cast. Ernie is shooting plenty of stunt action on trains.

* * *

Gilbert Warrenton, A. S. C., is photographing "Oh Doctor," Universal comedy drama, directed by Harry Pollard and starring Reginald Denny. The cast includes Mary Astor, Helen Lynch, Lucile Ward, William V. Mong, Tom Rickets and Otis Harlan.

* * *

Ira Morgan and George Barnes, both A S. C., members, have arrived in Hollywood for the filming of the next Marion Davies production. This is their first visit to Hollywood in many moons.

* * *

Robert Kurrle, A. S. C., has completed the camera work of "Madonna of the Streets," Edwin Carewe's latest production for First National. Mme. Nazimova and Milton Sills head the cast.

* * *

Georges Benoit, A. S. C., has left for Colorado where he will photograph "The Birth of the West" for the Colorado Picture Company. John J. Adolfi will direct. The cast will include Robert Frazer, Robert Edeson and Charles Murray. Advance plans say that 500 Indians, cowboys and soldiers will be used in the production.

* * *

H. Lyman Broening, A. S. C., is completing the cinematography on "This Woman," a Warner Brothers production directed by Phil Rosen.

* * *

Harry Perry, A. S. C., is shooting the first Motion Picture Directors Association production for Grand-Asher release. Paul Powell is directing.

* * *

. Paul Perry, A. S. C., has finished filming "The Grandstand Play," Emory Johnson's latest production, based, as the title implies, on the national pastime.

* * *

Karl Brown, A. S. C., has begun cinematography on James Cruze's next feature for Famous Players-Lasky. Betty Compson will be starred.

* * *

Alfred Gliks, A. S. C., is shooting Paramount's production of the late Emerson Hough's "North of 36," which Irvin Willat is directing. Hough, it will be remembered, wrote "The Covered Wagon."

* * *

King Gray, A. S. C., is filming Larry Trimble's latest production.

* * *

Due to a change in production plans, Bert Glennon, A. S. C., did not leave for New York City where Paul Bern's next production for Paramount was scheduled to be made. Instead, Bern has returned to Hollywood and his next feature is slated to be made at the Famous Players-Lasky West Coast studios.

While honors are heaping up for his work in "The Sea Hawk," Norbert Brodin, A. S. C., is hard at work on the filming of Frank Lloyd's next production for First National release.

* * *

Dan Clark, A. S. C., has been busier than ever filming Tom Mix's latest Fox feature.

* * *

Floyd Jackman, A. S. C., has joined hands with Fred Jackman and Homer Scott, both A. S. C., members, in working on the "trick" phases of First National's "The Lost World."

* * *

Arthus Edeson, A. S. C., has finished the filming of the character phases of the same production.

* * *

For the first time in many months, Walter Lundin, A. S. C., is not shooting his star, Harold Lloyd, for the reason that Lloyd has left on a trip to the east. Lundin's association with Lloyd has traced the rise of the comedian to one of the screen's most famous stars.

* * *

Kenneth MacLean, A. S. C., postcards from France that he will write at length from Rome, where he is to do special work on the Metro-Goldwyn-Mayer production of "Ben Hur."

* * *

Reginald Lyons, A. S. C., has been confined to the hospital as the results of an injury to his back sustained when Reggie was endeavoring, it is said, to rob the assistant of his perogative of carrying a camera up a hill—which proves that Reggie's duties have been weighty.

Seriously, Reggie had quite a siege although he is, with the aid of a cane, up and about now. It was at first thought that he had sustained a broken back but a series of a score or more of X-rays showed that there was a slight fracture—which makes Reggie aver that he couldn't get away from photography even in a hospital, but then it was a Hollywood hospital.

Reggie recovered just in time to be able to attend the Los Angeles opening of Vitagraph's "Between Friends," which, directed by J. Stuart Blackton from the Robert W. Chambers novel, was photographed by the A. S. C. member. Lou Tellegen, Alice Calhoun, Anna Q. Nilsson, Norman Kerry, Stuart Holmes and other celebrities appeared before Reggie's camera in this production.

The Los Angeles premiere was held at the Forum theatre, the newest of the city's long run houses, it having been opened with "America" some time ago.

* * *

Stephen S. Norton, A. S. C., has been in Santa Barbara, Calif., on location.

* * *

James C. Van Trees, A. S. C., is shooting his latest First National vehicle. John Francis Dillon is directing.

"Permanent Value"

PERMANENT VALUE—and the advertisers who take advantage of the pages of the American Cinematographer in its forthcoming "Dedication Number" will be disseminating the message of their product months after October, 1924, has slipped into the distant past. Present value? Yes—but more than that to the advertiser. His message will live and endure to a day when he himself may have long since forgotten that he ever wrote the ad—but the ad will go working on.

Many friends of the A. S. C., as soon as they heard of the plans to commemorate the opening of the new headquarters, immediately made arrangements for representation in the "Dedication Number." But there are still advantageous positions available in this enduring record—for those who decide in time.

The Place of the Motion Picture in Education

From Transactions, Society of Motion Picture Engineers

By Ernest L. Crandall
Supervisor of Lectures Board of Education New York City

Place of Films in Education Declared of Great Importance

Had this paper been prepared ten years ago, or even five years ago, it could hardly have borne the title I have given it. Almost inevitably it would have taken the interrogative form: "Has the motion picture a place in education?" Happily that question has now been answered and answered in the affirmative. Hence we are privileged rather to examine the question of precisely what place should be accorded to the motion picture in our educational process.

A Necessary Distinction

In saying that it has at last been determined that the motion picture has a place in education, I by no means mean to imply that the use of motion pictures as a medium of instruction has as yet been generally recognized by educators. That is not the fact. To some extent the motion picture has been adopted as an aid to instruction, thought its adaptability is still questioned in some circles. We have yet far to travel in that direction, but before we can even discuss that, there is a disinction to be made,— a distinction which is vital, namely, the distinction between the motion picture as an experiential fact and the motion picture as an implement of instruction.

The recognition and general adoption of the motion picture as a teaching tool, which is what many educators have envisaged and are steadily aiming at, is one thing. Quite another thing is the recognition of the motion picture as a force to be dealt with in education, as a factor in life that can no longer be ignored by the educator.

In this latter sense, the educational world might ultimately determine to leave the motion picture where it is, in the theatre, seeking only to improve and regulate it there, and not attempting in any broad and universal sense to utilize it in the formal educational process. Personally, I do not believe that this will be the outcome. However, the distinction we have made is as interesting as it is essential because it brings us face to face with a reformulation of our inquiry, and a reformulation which should prove illuminating if not conclusive.

Let us state our question then in the alternative form: —Is the place of the motion picture in education merely that of a great and practically universal fact or factor in life, which must be reckoned with, controlled, and even studied,—as is the case, for instance, with the drama; or is it also an instrumentality through which we can most effectively teach many other things?

The answer is that it is both. That it is the former the whole educational world has come to recognize, but to recognize only in a vague sort of way. The motion picture is here. It has invaded modern life so completely and so conspicuously that something must be done about it. But what? That represents just about the bewildered state of mind of great masses of the teaching profession on the subject.

On the other hand there are a definite few, who, recognizing this phase of the motion picture, namely, its importance as an experiential fact in the present and future life of the child, see in it also a teaching tool,— the most effective teaching tool ever placed in the hands of the trainer of youth, if properly harnessed to its task.

An an Experiential Fact

Let us consider for a moment the first aspect of the matter,— the motion picture as an experiential fact in life. From a curious toy or a dubious form of cheap amusement, the cinema has developed into a species of literature. It may be good literature or bad literature, but literature it certainly is, and a distince species of literature. It has its psychological basis, its laws of construction, its tricks and devices, its tropes and modes, white lists, and maintaining some sort of official or unlike any other form of literature. As such how are we as educators to treat it? Shall we leave it in the state of taboo under which the drama rested for centuries? Shall we merely try to curb, to constrain, to regulate? Shall we have done our full duty by preparing black lists and white lists, and maintaining some sort of official or unofficial, some sort of disguised or undisguised censorship? Or should we accord it a place in our curriculum, not as a mechanical device now, but as a subject of study, teaching our pupils to undestand its laws and to evaluate its standards, shaping their judgment and training their taste with regard to its output, just as the college and even the secondary schools have at last come to do for the drama, once the most neglected if not the most despised species of literature? This is a question most intelligently developed by Professor Charles H. Judd of Chicago University, in a paper published in the March, 1923, number of The School Review, published by Chicago University. I think there can be no doubt of the ultimate attitude of educators on this question, virtually all of whom, as I have implied, have at last been dimly stirred by its insistence. However, I feel that we are here today more distinctly concerned with the other question, namely, whether the motion picture is in itself an instrumentality through which many things can be taught most effectively?

Effective Teaching Tool?

For me, merely to state this question is to answer it. Asking if the motion picture can be used for teaching is like asking if water is wet, or rather let us say, if water slakes thirst or food satisfies hunger. If it is a form of literature, it is even more certainly a great, universally recognized and universally encountered form of expression. As such, it must take its place somewhere beside the printed page and the spoken word as a means of imparting ideas.

Universal Teacher

The fact is that the motion picture is teaching all the time. Indeed we are more or less disturbed, and with good reason, about the things it is teaching and the way it is teaching them. Leaving at one side this disturbing aspect, we have only to reflect for a moment upon the extent to which the screen has extended the mental horizon of great masses of our people, to be convinced of its educational efficacy. I think it cannot be gainsaid that more than any other agency in modern life, more than the flood of cheap books, the multiplicity of magazines or the illustrated newspaper, the motion picture has brought to the man in the street a knowledge of the world he lives

in, in virtually all of its aspects. Places, names, happenings far from his own habitat, discoveries, inventions, experiments, scientific or industrial, throughout the world, plans, problems and currents of thought in every field of human activity, glimpses of the past and speculations as to the future,—all these have come to mean more to the average man, especially the urban dweller, than ever before in the history of mankind, and all because the cinema in tireless and ingenious hands is visualizing for him daily the things that men are working at or thinking about everywhere.

Extension of Camera and Microscope

We must come a little nearer to the heart of our problem, however. To recognize the screen as a universal teacher, might be merely to class it with the newspaper, which, however, indispensable in the teaching of current events, is scarcely an ideal medium of universal application in the teaching process. The ideal value of the motion picture lies not so much in the fact that it is a form of expression, as in the fact that it is a recording instrument. Let us approach the question from a different angle.

In man's intellectual conquest of the world in which he dwells, there are just two instruments of his own invention that have furthered his progress and made possible his achievement. They are the camera of the explorer and the microscope of the scientist. Now the immense teaching value of the motion picture lies primarily in the fact that it is an extension of these two instruments. Indeed, we hear so much of socialization, I think it would be a rather happy phrase to describe the motion picture as a socialization of the camera and the microscope, making available for great masses at once, and virtually in perpetuity, the startling records of these two supersensitive extensions of human vision.

Before the motion picture came, the explorer or the globetrotter who returned from parts unknown had to content himself with publishing an illustrated volume or two, or a lecture tour illustrated with detached and lifeless, though of course often very beautiful views. Equally in those days, the scientist pouring over his microscope, was compelled to make most elaborate drawings and sketches, to convey even to his fellow scientists an idea of what went on beneath his eye. Today the explorer can take all mankind with him on his voyagings and the scientist invites the whole world into his laboratory. Thus the motion picture has a certain inherent power all its own that divests it for all of us of the commonplace and that in turn invests all of us with a sort of superconsciousness, as though we were in very truth gods or supermen. With it we mount up into the air, become companions to the cloud and ride upon the wind; with it we dive down into the water and bring up the secrets of the vasty deep; with it we explore the known and unknown surface of the earth, visiting not only far lands and strange peoples and bringing back a record of their manners and customs, their modes and standards of life, but penetrating forest and jungle from the frozen fastnesses of the poles to the festooned forests of the equator, spying upon the life habits of bird and beast and reptile; with it we approach the potentate upon his throne, accompany the statesman into his cabinet, invade the legislative halls of states and nations and sit as silent spectators at the very congress of the world; with it we accompany the soldier out upon the field of battle until the "rockets' red glare" and "the bombs bursting in air" are translated from poetic metaphor

to grim reality; with it we sit beside the sick bed with the watching physician or follow the surgeon's lancet through nerves and tissues, leaving an imperishable record for the guidance of future skill in difficult operations; with it we analyze the pulsations of the heart and number the life giving corpuscles as they course through the veins; with it we study the structure and the function of every living thing, and penetrate the mystery even of the cell, that unit of organic life; with it we visualize the action and reaction of molecule and atom and electron, and spy upon the virgin crystal as it rises, like Venus, from its bath in the chemical solution. No doors are closed to it, no secrets hid, no barriers insurmountable. Even the barrier of time recedes before it, so that through it and through it alone man has been able at least with measurable satisfaction to reconstruct past ears of the world's formation, rehearse the mighty pageantry of history, and forecast vast reaches of the future.

Substitute for Direct Sense Experience

Fundamentally, the value of the motion picture in education rests, of course, upon a psychological basis. The great bulk of our practical knowledge comes to us through the senses and by far the greater part of this through the sense of vision. It may be possible to reduce these proportions of percentages, as some have sought to do; but it seems to me a futile sort of exercise. It is matter of common observation that our eves are the most valuable part of our sensory equipment. Now, it may be possible by scription, explanation and narration to convey to others a fairly accurate impression of our sense experiences, through the written or spoken word. Obviously, however, this implies a considerable wealth of kindred sense experience on their part. Otherwise they would not be able to receive and interpret our account. If you want to test this just try to draft a description of a dog that you yourself believe would convey an accurate impression to an adult who had never seen one, and note the difficulties you encounter. Then take some six vear old child by the hand and walk down the street. You will discover that he recognizes every canine he encounters, though they may be of various colors, though some may have short hair and others long, though some may be twice as large as himself and others not much bigger than his pet kitten. The reason is that this is an item of knowledge that he has worked out for himself through the comparison and evaluation of his own immediate sense experiences. Other things being equal, then, that individual will be best informed who has the greatest wealth of well co-ordinated sense experiences.

Now, I think no one will dispute that the motion picture is in many aspects the nearest approach to and the most nearly perfect substitute for immediate observation, so far as the same is dependent upon mere vision. It must be remembered of course, that looking is not seeing, but that is equally true of actual vision. Certainly the motion picture does bring the world to the child's doorstep, as nearly as that is humanly possible to do. What he gets out of that panorama depends upon other factors.

Application to Geography

The importance of bringing the world of fact, as far as practicable, within the range of the child's vision rests upon the child's inevitable paucity of sense experiences. Even those children most favorably situated in life will possess meagre experiential background for the apprasial

of each new item of observation, as compared with the average adult. This lack is much greater with the great mass of children, a very small percentage of whom have ever travelled at all, or in any way transgressed the bounds of their own immediate environment. In fact, this is a lack so great that I think we educators realize its extent or the vital necessity of counterbalancing it.

We shall understand this problem better if we select some concrete subject of study, such as geography, as an example. Geography is regarded in some systems of education as the very core of instruction. In any conception of education the study of geography is an important and essential phase of the process of instruction. Socially, spiritually and intellectually man is heir to all the ages. In extracting the values from past centuries, history, of course, plays the principal role, but to attempt the study of history without a fundamental knowledge of geography is like sailing a ship on an uncharted ocean. Physically and in the most of his practical relations civilized man is as dependent as his primitive prototype upon his actual present environment. Individually and collectively his efforts are still bent chiefly upon supplying the three great primal needs of food, clothing and shelter, the satisfaction of which must be extracted from his environment. The chief difference between primitive and civilized man is that the latter has learned to extend his environment to the limits of the known world. In this process geography has been his chief concern,—a knowledge of the sources of supply for the meeting of these three great needs. In this sense geography has created history, dominates the life of the present and determines the conditions of the future. For it is primarily in the pursuit of this one primal task of ever growing complexity that man has undertakken explorations, established colonies, founded industries, ordained institutions, organized governments and enacted laws. Now let us consider for a moment the actual situation of two groups of children studying geography. Let us place one of them in New York, or some other coastwise city, and the other in some inland rural village. I think it will occur at once to all of you that the latter group will lack a great many sense experiences that are commonplaces with most of us. How many of them, do you think, will ever have beheld a crowded city thoroughfare, a great mercantile establishment where the wealth of a kingdom changes hands every day over the counter, a vast industrial plant with its manifold operations and its army of employees, so characteristic of our modern economic development, or a busy harbor with its forest of masts and funnels and its ocean greyhounds straining at the leash to whisk their 20th century argonauts across the seas in quest of richer argosies than old Homer ever dreamed of.

But this poverty of sense experience will be found scarcely more acute in the rural group than in the urban. Any careful and observant city teacher can cite you numberless examples of city children with no conception of the conditions of life outside the block in which they live. Hundreds and thousands of these urban little ones have never seen the shining plow lay bare the steaming furrow, have never seen the cattle grazing on a thousand hills, have never seen a field of waving grain, have never seen the foaming cataract leaping in dizzy whiteness from towering precipice to fertile valley or the laxy river gnawing its way through the plain and by the process of erosion and deposit building up the very soil on which and from which we live, have never seen that annual miracle of

nature, the apple tree bursting into fragrant blossom with each recurring spring, or watched how the sun practices his slow and patient alchemy upon the blossoms from the time the petals drop until the golden fruit hangs lusciously ready to drop into the basket. In short, countless numbers of these urban children have absolutely no notion of a thousand and one facts and processes upon which their very existence depends.

Now, without discounting or discarding every other available aid to visualization, if there is any one instrumentality that can so completely supply for these two groups the lack of immediate contact with essential facts and factors in the study of geography, as can the motion picture, I do not know what it is.

Limitations and Precautions

A little reflection will show you, also, that there are many other subjects, in some phase of which the motion picture may be made to render invaluable aid in assisting the pupil to a correct and complete visualization of that about which he is studying. We have found it of immense help in biology, not only in the portrayal of unfamiliar life forms but in the depiction and analysis of life processes. The same thing applies to nature study, for younger children. In chemistry it may be made to replace, to perpetuate or to supplement the laboratory experiment in many cases, while in applied physics there is nothing so effective for the analysis of mechanical processes as a skilfull combination of direct photography and animated diagram. In history and in literature, it plays the double role of re-enacting actual episodes and of painting an unfamiliar background. A child who has never seen Julius Caesar screened will at least know the difference between a toga and an overcoat, possibly nothing the advantages and the disadvantages of each; while a boy who has seen Doug' Fairbanks in "Robin Hood" has not only had a corking good time, but is really better prepared to understand and appreciate Scott's "Ivanhoe" or the mediaeval history that he gets in high school.

This is only a partial list, sufficient to show that there are few subjects which may not be illuminated by the screen. On the other hand, we must not fall into a not uncommon error of feeling that it can teach everything, or that it is a royal road to learning. First of all, neither the teacher nor the text-book can ever be replaced by the screen. It must always remain an aid to the one and a supplement to the other. Secondly, there are many phases of subjects which can be better illustrated through other media. The motion picture is essentially an expensive article. This is as true of the educational film as of the theatrical film, even though not in the same degree. The making of a good educational film involves the expenditure of a great deal of time, energy and money. It is wasteful to demand them or seek to apply them where simple devices are equally effective. Take a few simple examples. If I wished to show my class Niagara Falls or the great geysers of Yellowstone Park, I should select a good motion picture. If on the other hand I wanted to show them the capitol at Washington or take them on a visit to Westminster Abbey, I should greatly prefer a series of well made slides. If I wanted to show a boy the working of a linotype machine and could not take his to a printing establishment, I should have recourse to a motion picture, if one could be procured. But if I wanted to show him the invention and evolution of printing as an art, a few well chosen slides or charts would be equally effective.

There are a great many other problems, involving a great many other precautions which concern chiefly the professional educator. Indeed there are many pedagogical problems connected with the use of this latest teaching device about which none of us are any too clear as yet. We are not agreed as to whether the film should precede the recitation or culminate it. We are not certain whether it should be presented in silence or accompanied by explanation and discussion. We are not agreed as to whether it should be shown in sections or all at once. We are not sure whether its effectiveness is dependent upon the psychological age of the child or not.

One thing is very clear and that is that merely throwing motion pictures at the children is not using them as an educational instrument. Like any other teaching device, they must be fitted into the educational process at precisely that point and in precisely that way which is calculated to render them most effective as an aid to visualization. But, as I have said, this boy would hardly wish to concern itself with these particular problems.

Practical Problems

There are certain practical problems, however, in the solution of which the motion picture engineer may be of direct assistance to the educator. These turn chiefly upon the question of cost. The greatest deterrent factor in the educational use of motion pictures, to date, is their almost prohibitive cost. This is chiefly due to cost of projection. The techinque of producing pictures has advanced to a point approaching perfection, and that perfected teachinque will gradually address itself to the production of educational films, as rapidly as the market for them can be created. As that market broadens, the average cost of the pictures themselves will be diminished. Thus, while there is great difficulty in finding good pedagogic films at present and while those we do find cost too much, that difficulty is an inherent one. The cost of projection on the other hand can be reduced only by the perfection of cheap projectional devices, and that is where you can help us. Our projection problem is not that of the theatre. The technique is not the same. We do not require high power machines, with skilled operators and with artistically worked out lighting effects. What we need is a simple, portable projector, on which a straightforward bit of filming can be shown to a few score or a few hundred youngsters in a room that is not too dark. Every new lamp, every new lens, every new screen that is invented helps in that direction. The strides that have been made in the last few years have been remarkable. It is to the members of a body such as this that we must look for still more startling strides in the future. Indeed, with a little more attention to the scientific production of educational pictures and to the administrative problem of their effective distribution, we should be in a position right now to put the pedagogical film on a sound economis basis, were there not another deterrent factor which also turns upon cost. That factor is restrictive legislation.

Needed Legislation

We are not permitted in most jurisdictions to use the simple equipment to which I have just referred. We are compelled to resort to a standard machine, with booth and operator or go without pictures. The concededly dangerous character of nitrate of cellulose film and the very slow development of the acetate of cellulose film, not yet quite the equal of the other in certain essential qualities, have resulted in placing and keeping on the

(Continued on page 20)

(Continued from page 19)

statute books of most states the sort of restrictive regulation with which you are all familiar. This is a condition which can no longer be tolerated. Acetate of cellulose stock is now available in quantities as needed, and at a very trifling differential in cost, as compared with the nitrate stock. Big school systems, great welfare bodies and giant industries should no longer be treated as children and told they may not use this perfectly safe article, unless it is of an irregular width and perforation, for fear some irresponsible person will take chances and burn up things. The time has come to remove all restrictions from the use of the safe article, and to place all the restrictions and all the danger signals on the explosive article. This would have been the more logical procedure at the outest, though perhaps it would not have been entirely possible in the then state of the industry or of the public mind. An amendment to the New York State law, eliminating the narrow gauge restriction, was passed sometime ago, as a result of a bill introduced at the request of the Visual Instruction Association of America. This measure is not exactly ideal but it is an entering wedge. Also its introduction and our campaign for its enactment led to a series of conferences which have grown into a concerted movement. These conferences involved representatives of the Eastman Kodak Company, of the Motion Picture Producers and Distributors of America, Inc., and of other independent producers, as well as of various projector concerns. They also involved representatives of various fire protective agencies, such as the National Board of Fire Underwriters, the New York Board of Fire Underwriters and the National Fire Protective Association. Finally they involved representatives of our great school systems, and of the great welfare organizations, such as the Young Men's Christian Association, the Knights of Columbus, the Masons, and others having extensive educational programs, in which the free use of films is a desideratum.

The program is a very simple one. It consists essentially in treating inflammable film (and the inflammable sort only) very much as other explosives, or as dangerous drugs are now treated. That is, not only must the maker or dealer be licensed and keep open books, but every user must be licensed (at a nominal fee, of course) and must furnish his license number before he can procure a foot of film from any exchange. We feel that this places the burden where it belongs and that it is both practicable and effective.

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shot was made by cutting low over the heads of the slaves and by the diffusion of the background. A typical West Indian scene grew out of the California landscape because of the ability of the camera crew.

Two-fisted Action

"Captain Blood" gave little latitude for the testing of the artistic ability of the cameramen. There was too much slam-bang fighting action which called for technical ingenuity on the spur of the moment rather than long thought given to fixing the beauty first in the mind. Perhaps the most beautiful of all the exterior shots was the easiest and most inexpensive. It did, however, demand thought.

"Something Out of Nothing"

The love interest during the story had been handled throughout by the subtle touch of inference until it became such an important factor to move action that it must be brought to physical life. At that time, even, its touch was light and the camera was the vital thing to give it life yet hold it in repression. This scene was solely for the cameraman. An old pepper tree fortunately placed a few yards from the front of the exterior of the stage was the beginning. Added to that a few pots of ferns, a hole through the hanging bough of the tree a touch of paint on the stage, and the scene was ready for the lighting.

Manipulating Reflectors

Large tin reflectors, some of them

PICTORIAL SIDE OF "CAPTAIN BLOOD"

(Continued from page 7)

as large as 25 feet square, and a host of silver leaf mirrors were thrown in position to counteract the strong overhead sun light and bring the efforts of the players into artistic play were used. The cost element here was almost nil as the reflectors were better than the employment of expensive sun arcs. The resorting to of the chiffon screen was made use of again until the most beautiful tropical garden was set with enough sun on the actors to give them photographic value.

Well photographed sea stuff has a value to a picture beyond compare and at times is the hardest to get. "Captain Blood" is a story of the sea buccaneer and was not easy to take. The open sea has no place to fix a stationary camera point and no bottom near enough to use the parallels. At times it was necessary to build camera nests projecting 20 or 30 feet from the side of the boat and to tie the machine and operator securely. With the roll of the vessel it was a dip into the waist deep water and then a high and dry fling into the air, the men at the cranks panning to keep the small boats alongside into the shot until the bearings were hot. Sticking out from the side of a ship under full sail and geting pictures has its interest.

No Chance for Re-takes

The crowning point in the development of the story was reached in the filming of a gigantic sea battle where Captain Blood loses his famous Arabella in action. There is plenty of action in this sequence as one other large boat goes down at the same time. It was a shot that caught at the throat of even the oldest cameraman. If he did not get the stuff it was lost. There could be no retake the next day on any of it. When the 169-foot boat went to the bottom that was the end. No one failed. But with the terrific explosiion that ended the life of that stately old timer of the sea came a rain of wood and bits of iron that made the most hardened of the crew seek shelter under the tripods and crank with an off-set elbow movement. A slip here would have been all too costly, or the failure to operate properly would have resulted in ruin.

"Captain Blood," as said earlier, did not present any exceptional opportunities to photograph the extremely beautful but it did give occasion for the calling upon of all the experience and ingenuity possessed by the entire crew. That a splendid picture has resulted, at least photographically, will be seen by the exhibited production, and does not call for comment at this time. It is felt sure, though, that artistry was considered and fidelity upheld and problems met and conquered that meant well for the producer.

Testing Motion Picture Machines *for* Naval Use

From Transactions, Society *of* Motion Picture Engineers

By Lieutenant Commander C. S. Gillette, U. S. N.

How Uncle Sam Gives Gobs Entertainment *on* Land *and* Sea

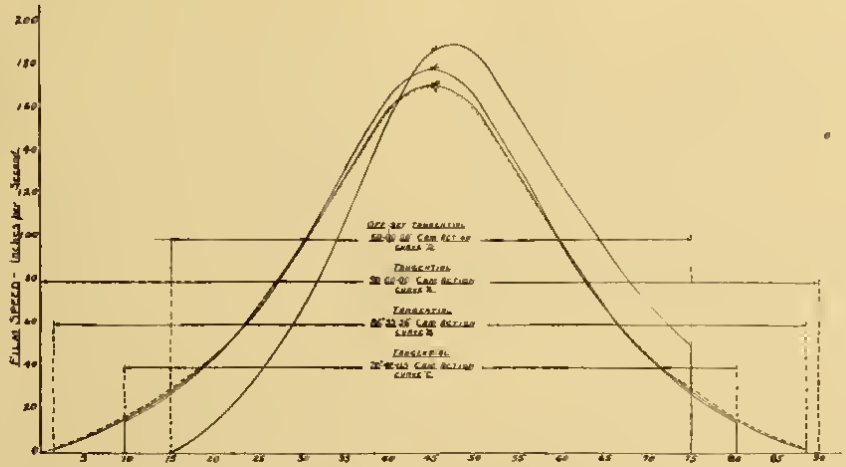

FIG 1
Film Velocity Characteristics Produced By Modification of the 90° Cam Action

The use of motion picture machines on board vessels and at stations of the Navy has been permitted for several years, but only comparatively recently has it been decided to furnish these machines as part of the regular standard Navy equipment. More specifically these machines were previously supplied through contributions from the individuals of a ship's crew or in some other manner from their own funds. Thus, whichever machine had the services of the most persuasive salesmen or by some other way most appealed to the fancy of the individual making the purchase, that machine was the one which any particular unit of the Navy used.

From Government Funds

The increasing importance of motion pictures from an educational standpoint, as well as for the general improvement of morale, so essential to the efficiency of such an organization, has rendered it desirable to supply the necessary equipment hereafter from Government funds. An investigation and test of the material available commercially was thus necessitated with a view to the preparation of standard specifications, having due regard to the peculiar nature of the service demanded by the Navy, in order that purchase in accordance with Government procedure could be made. The Laboratory of the New York Navy Yard was designated to make these tests and manufacturers of machines have co-operated in the most generous manner to aid the Government in meeting its requirements.

Sea Standards

It would appear at first thought that the conditions for satisfactory motion picture projection on a sea going vessel are not far different than the conditions met with in land practice. This to a great extent is true. Further, a fair percentage of the motion picture demand in the Navy is for shore stations, and these certainly require no special consideration, except that two separate standards would not be an economical practice. Hence, shore station machines should be the same as those used at sea. Standards must be set, therefore, by the needs of sea service only.

Careful consideration of this problem brought out some very important differences in the condition to be met with at sea in the Navy, as opposed to ordinary land practice.

Panned By Tars

The audience on board a Naval vessel is either quite large or small, dependent on the size of the vessel and the nature of its duty. On battleships, and of course, shore stations, we may expect anything up to one thousand men or more. It is in a sense an assured audience and often more or less compulsory—that is, it is compelled to attend the show by total lack of anything better to do. The choice of the manner in which one spends the evening is not very wide on the southern drill grounds. Hence, we do not have to meet competition in amusements nor cater to the whims of a critical audience. It must not be assumed, however, that our audiences are not critical. None is more so and they voice their criticisms in no uncertain

manner, but we do not have to worry about loss of patronage.

Film supplied for the use of the Navy is, from a practical standpoint, purchased outright, as it is leased for a term of years and long film life becomes at once a primary essential of operation. The films are made up in programs consisting generally of one main feature of five or six reels, two or three reels of comedy, and a news reel. As a rule about 8000 feet of film are used at each performance.

Sixteen Million Feet

There are in constant circulation throughout the Navy at the present time about 2000 complete programs as above, or about 16,000,000 feet of film. About eighty vessels and sixty shore stations are served, scattered pretty much all over the world. The programs are made up and sent out from a central exchange and these are passed from ship to ship or station until eventually each comes back to the central exchange. While circulating, minor repairs are made and if any portion is damaged to such an extent that it cannot be used for projection purposes, the entire program is returned to the exchange for extensive renewals or repairs and again returned to circulation. Every effort is made to keep a program intact until it has completed the entire circuit.

Naval Exchanges

The Central Exchange is located at the Navy Yard, New York, and twelve sub-exchanges assist the distribution in the United States, the Philippines, Hawaii, the Canal Zone and on board certain of the repair ships. The Central Exchange is equipped to inspect, repair, clean and process film and provides training for operators and censorship for the outgoing programs. The service is completed in all details and it is believed will compare most favorably with any commercial system when consideration is given to the fact that it supplies and maintains service all over the world.

Portable Equipment

On board a vessel of the Navy all the equipment for projection must, of necessity, be easily portable. Each performance requires a complete set up of machine, screen and seating arrangement either above or below decks as the weather conditions may permit. Usually performances are given in the open air on deck, whenever at all possible, as more seating capacity is there available. The audience views the performance from the front of the screen where possible, but often on deck a fair percentage enjoy the reverse side of the screen at no great disadvantage except some trouble in deciphering the titles. At present canvas screens used and each ship prepares or selects its own. Standardization is in prospect for this equipment also.

The machines are operated exposed on deck, and must be taken down and stowed away after each performance. Space is limited on board ship and easy stowage, in the smallest possible space, fully protected against the elements and the motion of a vessel at sea is essential. Taking machines below deck means passing them through one or more small hatches, down ladders and through narrow passageways, with attendant possibility of damage.

Sea air is highly corrosive and attacks readily exposed surfaces of materials susceptible to its action, no matter how carefully used and stored. Hence non-corrodible materials must of necessity be used for important parts wherever at all possible and when not possible special means must be taken to cover same with intimate protective coatings, such as galvanizing, sherardizing, etc. Even all of the relatively unimportant parts should be satisfactorily protected. Sheet metal in particular should be of non-corrodible material. Cast metals are not so readily attacked by sea air but should be given suitable protective coatings in any case.

Galvanizing

The ordinary film reels, for example, are quickly attacked and ruined. For this reason galvanized wire reels are being tried out and something along this line will undoubtedly become standard. The corroded reels have caused in the past considerable damage to film, and have been the direct cause of much unnecessary film expense.

Where Dust Comes From

The general mechanical features of the machines needed do not require any special consideration except that they should be reasonably fool proof and that all gears and operating parts should be enclosed and made as nearly dirt and dust proof as possible. It is not claimed that the sea is particularly dusty, but on board any ship, more particularly the coal burner, the soot and cinders from the stacks often under forced draft, are extremely troublesome on gears, bearings and moving parts. Exposed operation on deck increases the probability of trouble if the design does not take account of this feature.

Electrically, commercial designs seem satisfactory in most respects. Variable motor speed does not seem essential for our purpose, as it allows too much leeway for an operator to ruin film by needless speed of projection to get through a performance quickly. We do not run two shows an evening and time does not mean money, but to shorten it means film expense.

No Ready Service

Miscellaneous requirements which have been considered are suitable means for ready disassembly and stowage of parts as previously mentioned; adoption of a standard film length per reel, viz., 1000 feet, and, most important of all, ready interchangeability of parts between machines of the same type and manufacture. This last point is especially important, due to the distribution of the machine over the world and the necessity for quick repair with the limited facilities and by the personnel on board ship. On a vessel of the Navy, spare parts are not available in a store around the corner nor can the services of an expert be obtained with no greater effort than a telephone call.

Manufacturers of any Marine equipment should be at some pains to render identification and ordering of spare parts for their product as easy a matter as possible, so that orders from distant parts of the world can be readily interpreted and parts furnished without possibility of error.

How It Works

It might be added that motion picture machines in the Navy are not directly essential to the operation of a vessel nor to its fighting efficiency. We do not need 100% efficiency in spite of high cost for this class of equipment, as often is the case for certain other classes. We need the maximum amount of amusement at the minimum first cost and maintenance expense just as commercial practice demands, and the factor of safety in insuring this relationship we can afford to let rest at unity. We do not take this chance with fighting equipment. There the factor of reliability must be high. It does not pay to follow a dollar pinching policy where a dollar saved may mean the

failure of vital apparatus at a critical moment of battle. Failure at such a moment may mean loss of a battleship—loss of a battleship, the loss of a battle—and a loss of a battle, the loss of a nation—and the loss of a nation, the loss of liberty and everything else that makes life and civilization worth while.

Naval Needs

To return to motion picture machines, we may sum up the special desirable features of a machine to meet conditions on board a Naval vessel somewhat as follows:

(a) Designed to give longest film life possible.

(b) Arranged for easy disassembly, portability and stowage.

(c) All operating parts to be well protected and of non-corrodible material or suitably protected against corrosion.

(d) Ready accessibility for repair and interchangeability of spare parts to be assured.

(e) Large enough to give projection suitable for audiences up to 1000 persons, (120 ft. projection) at a standard film speed of 90 feet per minute and to handle reels of 1000 feet only.

(f) To be as fool-proof and require as little maintenance expense as possible.

The testing of commercial machines to ascertain how nearly they meet our needs and to collect data for suitable specifications has been carried out at the Navy Yard, New York, over a period of about one year and is still in progress. A fully equipped photometric section was here available in the laboratory which was deemed the best equipped place to handle this problem.

A 14 x 14 foot standard screen of plaster finished mat white was supplied with a throw of 100 feet. Such a screen is easily maintained at its maximum efficiency and while not ideal, is used as a 100% screen. By comparison other screens will be rated against this one, which of course, may give some types a rating of over 100%.

When a machine comes in for test, it is fully adjusted by a representative of the manufacturers on the test floor and as soon as he has adjusted it to his full satisfaction, it it taken over for official test and considered 100% perfect for that particular type.

Steadiness

Tests for steadiness of projection are made first. Such tests are made rather critical by taking the picture jump at the full 100 foot projection.

The picture jump seems by analysis to be the result of two contributing factors, one due to machine and building vibration and one inherent with the film and mechanical operation. No attempt is made to separate that due to film variation and the operation of the machine, as the first is compensated for by using the same film on all machines.

Standard film for this purpose has been adopted and standardized, and consists of a light struck and developed negative perforated by two rows of 1 m-m holes, about eight per aperture. Sprocket perforations are standard and made prior to developing. A small brass plate perforated in the same way as the film is first projected with no mechanism in operation and the jump of the holes taken as that due to conditions external to the machine. Then the mechanism is started including shutter and the jump of the projected holes from the plate again measured. The difference between the two gives the unsteadiness produced by the operation of the mechanism itself.

Finally the test film is threaded through and the jump of the projected film holes taken which is cumulative from all causes. Data are thus obtained which will give apparently all necessary information about the action of the machine while handling film. A quite appreciable picture jump appears inherent in all makes of machines and direct comparison is possible with very interesting results.

Wear

Attempt is then made to determine characteristic film wear for each type. This determination for the present is limited to that caused by the feeding sprockets and intermittent only, take up tension not having been considered to date. The latter is manually adjusted and wear from this cause is more or less attributable to the operator and not reasonably chargeable to the machine.

An endless belt of film is used of sufficient length to just thread through the mechanism and around the outside of the head without interference when operating. The mechanism circulates the belt unilluminated and data are taken as to the number of revolutions of the belt through the machine before sufficient damage is done to cause breakage of same. Periodic inspection every 50 revolutions is made and the condition of the belt recorded. Belt made of standard commercial feature positive film is used for this purpose, thus allowing various densities of emulsion and determination of average results. Six belts are run on each machine initially, and experience has shown that the consistent results can be readily obtained with reasonable care.

So consistent have been the results obtained that some important conclusions seem justified, particularly in regard to the design of the intermittent movement Two or more heads of each make of several different manufacturers have been tested and the results on any given make have been uniform and seem to establish certain inherent characteristics of the type in regard to film wear. Some points in connection with this will be discussed later.

200 Hours

After this initial performance on film, the machines are set up complete and given a run without film for 200 hours on a cycle of 8 hour continuous operation, followed by a 16 hour shut down. After each shut down the machines are completely oiled and again at the start of an 8 hour run. The object of this test was to obtain only comparative data, to bring out the weakest point of the design, and to determine the suitability of bearings, gears, etc. This test was strenuously objected to by some manufacturers, as demanding of the machine more than any probable service condition. However, while no laboratory test can be expected to simulate perfectly service conditions, such a test does give in a reasonable time, a very good indication of probable service life, under ordinary operation in the hands of the "run of the mine" operator.

The Irony of It

If a mechanism under service conditions received all the care and attention its designer recommended, operating expenses would be increased a few hundred per cent, but it would probably have a long and useful service life. Unfortunately for the proud designer, his product does not always lead a sheltered existence under tender care but must bear up under the hard knocks of the world and the neglect of a hard-hearted operator.

At the end of this 200 hour run, picture jump and general steadiness is again taken. The differences in the operation at this time compared with the prior results

are considered a measure of the wear and probable service life.

Inspected and Gauged

After this second set of data has been obtained the machine is thoroughly inspected and gauged. A representative of the manufacturer is then allowed to completely overhaul and adjust the machine, renewing and parts he deems necessary. This is done under the supervision of the test personnel and all work done, replacements, alterations of settings found necessary, etc., are recorded. When pronounced again in perfect condition by the exhibitor, the picture jump and film wear tests with the belts is again taken and compared with the previous data.

In many cases it has been found that the readjusted machines give considerably better performance than they did originally. This seems to indicate that better and more consistent machines could be placed in service generally if manufacturers ran in their machines thoroughly after assembly as a part of regular factory routine, and made sure that they were properly adjusted before sending them out. This, of course, applies to almost any equipment and it is realized adds to cost of production However, it is mentioned here for the benefit of those interested both from a manufacturer's and from an operator's standpoint and indicates one direction, at least, in which improvement can be expected in present machines. It is probable that a Navy specification will call for some such procedure before acceptance on delivery.

Considering that repairs in the field are always so difficult and unsatisfactory and interruptions to service so expensive, it appears that commercial users would find such a run-in test most desirable and would insist upon something of this nature when buying equipment. Our tests have satisfied us at least that it would be a paying proposition regardless of some slight addition to first cost.

Our tests have led us to investigate rather thoroughly the design of the intermittent movement and its relation to film wear Commercially film wear perhaps is not such a vital factor in a machine. The Navy purchases its film and hence its interest in this important characteristic.

The intermittent movement is, of course, the very heart of the mechanism, and probably the most important single factor controlling film wear as well

Curves (Figure 1) are presented herewith showing the characteristics of three ordinary Geneva Star and Cam movements of slightly different design for purposes of comparison, and also the curve for the so called eccentric Geneva Star and Cam movement. These curves have been worked out mathematically and plotted according to a formula evolved for the purpose. The derivation will not be gone into here but can be furnished for anyone interested.

The life of the film with each of the three designs of ordinary Geneva Star movements here shown has been carefully taken and same found to vary consistently with easy modification.

While it is realized that the faster the movement the more light will be possible at the screen and theoretically the better will be the projection, practically no great difference was realized with the three designs shown. But the film wear was increased whenever the design departed from the full 90° cam action with the star and pin meshing on the tangent to the driving pin circle and pin leaving the star in the same way.

This design incorporates a mathematical 1 to 1 ratio between the diameter of the star over the points and the pin circle of rotation. These dimensions and the relative dimension of all other parts of this movement must be made with the greatest accuracy humanly possible to produce the exact tangential meshing necessary for satisfactory results. And this form is apparently the ideal arrangement for starting a body from rest, accelerating it through a maximum speed point and again bringing it to rest, without shock or sudden strain at any part of the operation.

Changes in Velocity

It may be noted from the curves given that the 90° movement starts and stops with smoothly graded acceleration and deceleration. The inertia of the film is overcome smoothly in starting and in stopping with this movement. All the others show abrupt changes in velocity in either starting, stopping or both—in other words, marked jerks on the film are the result of each of these operations.

Both theoretical and practical results have demonstrated to our satisfaction the speriority of the 90° Geneva Star and Cam in prolonging film life through at the same time producing lower screen illumination. With it the shutter must be dark at least 180°, and in ordinary practice is usually somewhat more. The light efficiency using this type seems to be about 42%, that is with the mechanism in operation the illumination on the screen proves to be about that percentage of the light on the screen with mechanism stopped.

Compromise

Of course, the greatest screen illumination with the least power consumption is always desirable. To accomplish increased intensity by decreasing the angular mesh of the star and pin and the consequent allowed increase of open interval on the shutter, is to sacrifice film life to increased screen illumination. It is easily seen that a compromise is necessary based on whatever may be considered the paramount demand of the service to which applied.

The gain in screen illumination between the faster intermittent of 70° show on the given set of curves over that of the 90°, has been proved by our tests to be about 7%. So it seems that a very considerable increase of film wear must be shouldered to gain a very small percentage in light at the screen.

Perhaps at one time the fast intermittent was of some value in producing steady pictures, as the previous projection speeds, we understand, seldom exceeded about 60 ft. per minute. Hence, a slow type of intermitten at this projection speed might have produced unsteadiness to a great extent.

At 90 to 100 feet per minute, however, following the increased photographic rate, the 1 to 1 intermittent has proved entirely satisfactory, in so far as our tests are concerned, with respect to film steadiness and very superior with respect to film wear and machine wear as well.

It can be shown that the angular speed of the star at any instant is equal to the product of the instantaneous speed of the pin by the sine of the angle subtended between the tangent to pin circle and the center line of the star slot along the star radius. With the 90° movement the speed at the point of first contact is zero. In the case of the 80° movement, for example, which makes contact 5° later, an abrupt change of velocity is produced instantly from zero to the 5° velocity of the 90° movement, thus giving the marked jerk mentioned. A similar effect oc-

curs at the stop. Consideration of these points will make the curves clear.

A further interesting result in the use of the 90° movement is that the required accuracy in adjustment of the tension shoes is far less than that demanded by the faster types. With the former, this attachment has little to do beyond holding the film firmly to the aperture and giving some slight braking action to the mass of the film already brought to a stop by the action of the intermittent. With the faster types, the setting of the tension shoes seems very critical, as they are called upon not only to accomplish the above but in addition must stop the whole moving film instantly as the faster intermittent, because of its design, does not effectively do this. The film is not brought gradually to a full stop but must in effect stop itself when the intermittent disengages, as may be noted from the curves. It appears also that unsteadiness of picture is more likely to result from the fast intermittent than the slow one if an operator is not especially careful in setting the tension shoes to prevent the film over-riding the aperture. If shoes are set over tight then film wear is increased with possible tearing of film and interruption to service.

Adjustable Tension

We have been informed that adjustable tension is necessary to compensate when using old or new film. With the slow intermittent our results have indicated satisfactory performance on all film tried with no variation in adjustment at all. With the fast types this was not the case and adjustment for new and old film was necessary. Soft new film having a higher coefficient of friction, of course required less tension on the shoes to accomplish their function as explained. Shoes set for old film tore new film, and those set for new film allowed picture jump with old. It seems then that deficiencies in design of the intermittent are compensated by adding an adjustable device which requires very critical adjustment by the operator for each kind of film run to insure entirely satisfactory service.

The foregoing are some of the reasons why we feel convinced that, for our purposes, only the 90° Geneva Star and Cam will meet the requirements. This intermittent which has been previously referred to as the 1 to 1 based on ratio of star and pin circle diameters is the same as is sometimes referred to as the 1 to 3, based on the ratio of time of moving to the stopped periods per revolution. It is hoped no confusion will be introduced by the pharaseology used.

Closely connected with the intermittent problem in the quality of projection and film life appears the sprocket design This seems to have been pretty well worked out by the Eastman Kodak Company, on the standard film perforation, considering film shrinkage, etc.

However, our tests have revealed no machine submitted which actually followed the data of the above named company in their sprocket design.

The length of the arcs of film contact on the various sprockets does not seem, in general, to have received much consideration and certainly no standardization. One make only appears to have given it consideration really worth while.

The more teeth in mesh the greater will be the effect of the film change through shrinkage and unless this is compensated serious film damage seems likely to result.

It is hoped that the general question of intermittent design has not been too much stressed. It is not meant by this to convey the impression that many other things, such as framing, shutter design, etc. are not thought to be of great importance in efficient projection. It is only that the intermittent is believed to be of the greatest importance for our purposes.

Commercially perhaps the cost of film is not greatly considered and the amount of film damage chargeable to a given design is not readily apparent. But unless film producers are running for charity, the operators must be paying the combined cost of an enormous amount of uselessly damaged film through increased film rental charges.

The automobile engineer did not, in the early history of the industry, consider to any great extent tire mileage nor the effect of his design to increase or decrease it. Today it is one of the first considerations of design and one of the first questions asked by a prospective purchaser.

The Navy is trying to standardize many of the machine accessories for its use at the same time. Projection distance will be standardized for the different types of ships and the size of the screen, and the lens feature and general characteristics will also be made standard.

Condensers seem at the present time to be more or less in the development stage. Some recent very radical changes indicate no general fixed commercial policy concerning this feature. Machines in service are subjected to most severe changes in temperature and it is to be hoped that a suitable heat resisting glass will soon be available.

The greatest advantage to be gained in a more or less complete standardization is simplicity in the stocking and distribution of spare parts and accessories to our widely separated projection stations about the seven seas and to increase the efficiency of operators and repair personnel through restriction in the number of types used. Finally it is hoped that economy in first cost and maintenance expense of machines and film will naturally follow standardized practice.

Releases

July 20, 1924 to August 17, 1924

TITLE	PHOTOGRAPHED BY
Behold the Woman	Wm. O'Connell and Ernest Smith
Fighting Fury	Harry Neumann
Tess of the D'Urbervilles	David Kesson
The Side Show of Life	James Howe
The Desert Sheik	Broun-Thomas
Against All Odds	Joseph Brotherton, **member A.S.C.**
Neglected Women	Not Credited
Big Timber	Jackson J. Rose, **member A.S.C.**
The Red Lily	Victor Milner, **member A.S.C.**
Single Wives	James Van Trees, **member A.S.C.**
Manhandled	Hal Rosson
The Call of the Mate	Roland Rice
That French Lady	G. O. Post
Western Vengeance	Walter Griffin, **member A.S.C.**
The Man Who Fights Alone	L. Guy Wilky, **member A.S.C.**
Little Robinson Crusoe	Frank B. Good, **member A.S.C.**
Racing for Life	Not Credited
Hutch of the U.S.A.	Ernest Miller
Janice Meredith	Ira Morgan and George Barnes, **members A.S.C.**
Hit and Run	Virgil Miller
Being Respectable	H. Lyman Broening, **member A.S.C.**
Broken Barriers	Percy Hilburn
Love and Glory	Gilbert Warrenton, **member A.S.C.**
How To Educate A Wife	Charles Van Enger, **member A.S.C.**
Strangling Threads	Not Credited
Lend Me Your Husband	Jack Brown and Neil Sullivan
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Kull Edward—with Universal Studio
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Landers, Sam—with First National, United Studio
Lockwood, J R—
Lundin Walter—with Harold Lloyd Productions, Hollywood Studios
Lyons Reginald E—
MacLean, Kenneth G—with 'Ben Hur, Rome, Italy
Marshall, Wm—with Carlos Prods
Meehan George—with Henry Lehrman Fox Studio
Milner Victor—with Joseph M Schenck Prod
Morgan Ira H—with Marion Davies Cosmopolitan
Norton Stephen S—with Universal Pictures Corp
Overbaugh Roy F—New York City
Palmer, Ernest S—
Perry Harry—with Paul Powell M P D A Prod
Perry, Paul P—with Emory Johnson Prod R C Studios
Polito, Sol—with Hunt Stromberg Productions
Ries, Park J—
Rizard George—New York City
Roos Len H—Leigh Spencer Bldg, Vancouver B C
Rose Jackson J—Clarence Brown Universal
Rosher Charles—with Mary Pickford Picklord Fairbanks Studio
Schneiderman, George—with Fox Studio
Scott Homer A—First National, United Studios
Seitz John F—with Rex Ingram
Sharp Henry—with Thomas H Ince
Short, Don—
Smith Steve Jr—with Vitagraph Studio
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Sinmar Charles—with Universal Studio
Tolhurst Louis H—'Secrets of Life Microscopic Pictures, Principal Pictures Corporation
Totheroh, Rollie H—with Charlie Chaplin, Chaplin Studio
Turner J Robert—with Fox
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